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| EXAMINER | |
|---|---|
| HARPER, V PAUL | |
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| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/688,802 | HETHERINGTON ET AL. | |
| | Examiner | Art Unit | |
| | V. Paul Harper | 2626 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) 1-35 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-35 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Information Disclosure Statement*

1. The Examiner has considered the references listed in the Information Disclosure Statements dated 6/02/2004, 07/12/2004, 06/26/2004, 08/19/2004, and 10/16/2006. Copies of these Information Disclosure Statements are attached to this office action.

### *Claim Objections*

2. Claim 34 is objected to because the number 34 is used to indicate two different claims. In the art rejections below, the separate claims are identified as 34A and 34B.

Correction is required.

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 5 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. This claim seems to be self-contradictory. How can the noise detector be configured to "prevent the attributes of the modeled wind buffet from exceeding their respective average

values". If the attributes are used to calculate the average, how can there not be values above the average?

The following art rejections are made using the most reasonable interpretation of the claim language in view of the art.

***Claim Rejections - 35 USC § 101***

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. To determine whether claims 1, 16, 23, 24, 27 and 28 comply with the subject matter eligibility requirement of 35 USC 101, we ask

Q1—does the claimed invention fall within one of the statutory classes?

Yes, system, method and computer program claims.

Q2—does the claimed invention fall/cover/include a judicial exception?

Yes, abstract idea – claims 1, 16, 23, 24, 27 and 28 are seemingly a patentable process (or system or program), however, it is in reality seeking patent protection of the computer program in abstract as evidenced by the description in the SUMMARY paragraphs indicates that the invention is voice enhancement logic, where logic is interpreted to mean algorithms.

Once the answer of Q2 is a "yes", continue to ask the following:

a) Is the claimed invention a practical application by physical transformation? No, there are no outputs of [noise reduced] signal.

b) Is the claimed invention a practical application that produces useful and tangible result? No, there are no outputs of [noise reduced] signals.

If the answer to both a) and b) is no, then the claimed invention is nonstatutory.

Claim 1, 16, 23, 24, 27, 28 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 3-15, 17-22, 25, 26, 29-35 are also rejected for depending upon a rejected base claim and not remedying the situation.

Claims 28-35 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. In this case, computer program where no preemption is permitted (see "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" p. 35 v. No preemption Permitted).

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1, 9, 11-13, 15, 28-30, 32, and 34A are rejected under 35 U.S.C. 102(e) as being anticipated by Yang et al. (Patent Application Publication US 2003/0040908), hereinafter referred to as Yang.

Regarding **claim 1**, Yang discloses a noise suppression system for speech in an automobile. Yang's teachings include the following:

- a noise detector that detects and models a wind buffet from an input signal (¶[6], detects noise including wind noise; ¶[29] using a time-varying noise spectrum estimate, i.e., a model of the changing [wind buffet] noise); and
- a noise attenuator electrically connected to the noise detector to substantially remove the wind buffet from the input signal (¶[6], a large portion of the noise is removed).

Regarding **claim 9**, Yang teaches everything claimed, as applied above (see claim 1). In addition, Yang teaches "the noise attenuator is configured to substantially remove the wind buffet and a continuous noise from the input signal (¶[70], the cancellation of non-stationary as well as stationary noise).

Regarding **claim 11**, Yang teaches everything claimed, as applied above (see claim 1). In addition, Yang teaches "an input device electrically coupled to the noise detector, the input device configured to convert sound waves into analog signals" (¶07, a microphone which converts sound waves into an analogy signal; Fig. 1A, and 2, VAD and noise suppression unit).

Regarding **claim 12**, Yang teaches everything claimed, as applied above (see claim 1). In addition, Yang teaches "a pre-processing system coupled to the noise detector, the pre-processing system configured to pre-condition the input signal before the wind noise detector processes it (¶[25] analog signals are filtered and amplified).

Regarding **claim 13**, Yang teaches everything claimed, as applied above (see claim 12). In addition, Yang teaches "pre-processing system comprises first and second microphones spaced apart and configured to exploit a lag time of a signal that may arrive at the different detectors the use of a beam forming unit (Fig. 7, ¶s74-84, microphone array, beam forming unit—where beamforming inherently uses lags and delays between microphones to improve signal quality).

Regarding **claim 15**, Yang teaches everything claimed, as applied above (see claim 13). In addition, Yang teaches "a second noise detector coupled to the noise detector and the first microphone" (abstract, a second signal detector; e.g., Figs. 2, 3, 4A).

Regarding **claim 28**, Yang discloses a noise suppression system for speech. Yang's teachings include the following:

- a detector that converts sound waves into electrical signals (¶25, microphone to analog sigal);
- a spectral conversion logic that converts the electrical signals from a first domain to a second domain (Fig. 4A, FFT time domain to frequency domain); and
- a signal analysis logic that models a portion of the sound waves that are associated with the wind (¶06, wind noise, ¶07, undesired component [including wind noise] is detected; ¶s 08-10, describe various noise analysis techniques).

Regarding **claim 29**, Yang teaches everything claimed, as applied above (see claim 28). In addition, Yang teaches "logic that derives a portion of a voiced signal masked by the noise" (¶06, "...to generate a desired output signal having predominantly speech").

Regarding **claim 30**, Yang teaches everything claimed, as applied above (see claim 28). In addition, Yang teaches "logic that attenuates portion of the sound waves" (¶06, "...with a large portion of the noise removed ...").

Regarding **claim 32**, Yang teaches everything claimed, as applied above (see claim 28). In addition, Yang teaches "noise estimation logic that measures a continuous or ambient noise sensed by the detector" (¶29, noise estimates for

stationary and non-stationary noise; also ¶03, model background noise during periods of non-speech activity).

Regarding **claim 34A**, Yang teaches everything claimed, as applied above (see claim 28). In addition, Yang teaches "the signal analysis logic is coupled to a vehicle" (title, for speech in an automobile; Fig. 1A).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 2, 16, 18-21, 23 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yang in view of Shust et al., ("Electronic Removal of Outdoor Microphone Wind Noise" Acoustical Society of America 136th Meeting Lay Language Paper, Oct. 1998), hereinafter referred to as Shust.

Regarding **claim 2**, Yang teaches everything claimed, as applied above (see claim 1). But Yang does not specifically teach "the noise detector models a line to a portion of the input signal." However, the examiner contends that this concept was well known in the art, as taught by Shust.

In the same field of endeavor, Shust teaches the electronic removal of wind noise. Shust's teachings include a detector and a linear prediction model (p. 2, ¶2, and Fig. 1).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Yang by specifically providing the features, as taught by Shust, because it is well known in the art at the time of invention for the purpose of allowing a model to predict effects of wind noise based on wind speech (Shust, p. 2, ¶2).

Regarding **claim 16**, Yang discloses a noise suppression system for speech. Yang's teachings include the following:

- a time frequency transform logic that converts a time varying input signal into the frequency domain (Fig. 4A, FFT converts waveform to frequency domain);
- a background noise estimator coupled to the time frequency transform logic, the background noise estimator configured to measure the continuous noise that occurs near a receive (Fig. 4A, ¶s 40-42, X is used to make estimates of the mostly noise signal).

But Yang does not specifically teach "a wind noise detector coupled to the background noise estimator, the wind noise detector configured to automatically identify and model a noise associated with wind." However, the examiner contends that this concept was well known in the art, as taught by Shust.

In the same field of endeavor, Shust teaches the electronic removal of wind noise. Shust's teachings include a detector and a linear prediction model that respond specifically to wind velocity (p. 2, ¶2, and Fig. 1).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Yang by specifically providing the features, as taught by Shust, because it is well known in the art at the time of invention for the purpose of allowing a model to predict effects of wind noise based on wind speech (Shust, p. 2, ¶2).

Regarding **claim 18**, Yang in view of Shust teaches everything claimed, as applied above (see claim 16). In addition, Shut teaches "the wind noise detector is configured to derive a correlation between the line and a portion of the input signal" (p. 2, Fig. 1, ¶s 2 and 3; "... how well a linear system fits between the wind velocity and microphone signals.").

Regarding **claim 19**, Yang in view of Shust teaches everything claimed, as applied above (see claim 16). In addition, Yang teaches "a signal discriminator coupled to the wind noise detector, the signal discriminator configured to mark the voice and the noise segments of the input signal" (Fig. 2, ¶26, voice activity detector; ¶28).

Regarding **claim 20**, Yang in view of Shust teaches everything claimed, as applied above (see claim 16). In addition, Shust teaches "a wind noise

attenuator coupled to the wind noise detector, the wind noise attenuator configured to reduce the noise associated with the wind that is sensed by the receiver" (Fig. 1, p. 3, ¶1).

Regarding **claim 21**, Yang in view of Shust teaches everything claimed, as applied above (see claim 16). In addition, Yang (and Shust) teaches "where the noise attenuator is configured to substantially remove the noise associated with the wind from the input signal" (Yang, ¶06, ...wind noise....with a large portion of the noise removed...; Shust, Fig. 1, p. 3, ¶1).

Regarding **claim 23**, Yang discloses a noise suppression system for speech. Yang's teachings include the following:

- a time frequency transform logic that converts a time varying input signal into the frequency domain (Fig. 4A, FFT converts waveform to frequency domain);
- a background noise estimator coupled to the time frequency transform logic, the background noise estimator configured to measure the continuous noise that occurs near a receiver (Fig. 4A, ¶s 40-42, X is used to make estimates of the mostly noise signal).

Yang also teaches the use of different types of sensors (¶22) and a variety of algorithms (¶36), but Yang does not specifically teach

- a wind noise detector coupled to the background noise estimator,
- the wind detector configured to fit a line to a portion of an input signal;

- a wind attenuator coupled to the wind noise detector means;
- the wind attenuator being configured to remove a noise associated with wind that is sensed by the receiver. However, the examiner contends that this concept was well known in the art, as taught by Shust.

In the same field of endeavor, Shust teaches the electronic removal of wind noise. Shust's teachings include a detector, a linear prediction model (fitting a line to the input signal) that responds specifically to wind velocity , and the removal of noise associated with the wind (p. 2, ¶2, and Fig. 1).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Yang by specifically providing the features, as taught by Shust, because it is well known in the art at the time of invention for the purpose of allowing a model to predict effects of wind noise based on wind speech (Shust, p. 2, ¶2).

Regarding **claim 35**, Yang teaches everything claimed, as applied above (see claim 28). But Yang does not specifically teach "the signal analysis logic models only the sound waves that are associated with the wind." However, the examiner contends that this concept was well known in the art, as taught by Shust.

In the same field of endeavor, Shust teaches the electronic removal of wind noise. Shust's teachings include a detector and a linear prediction model that respond specifically to wind velocity (p. 2, ¶2, and Fig. 1).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Yang by specifically providing the features, as taught by Shust, because it is well known in the art at the time of invention for the purpose of allowing a model to predict effects of wind noise based on wind speech (Shust, p. 2, ¶2).

7. Claims 4, 10, 24, 26, 27 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yang in view of Buchele (US Patent Application Publication 2003/0151454) hereinafter referred to as Buchele.

Regarding **claim 4,** Yang teaches everything claimed, as applied above (see claim 1). But Yang does not specifically teach "the noise detector is configured to model the wind buffet by calculating a signal offset." However, the examiner contends that this concept was well known in the art, as taught by Buchele.

In the same field of endeavor, Buchele discloses an adaptive speech filter to suppress ambient low frequency noise associated with wind and the use of a peak detector [signal offset] circuit that can respond to wind gusts (i.e., when the input signal crosses a line it detects a wind gust) and effectively suppress them (¶s, 34, and 40).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Yang by specifically providing the features, as taught by Buchele, because it is well known in the art at the time

of invention for the purpose of being responsive to rapidly changing circumstances (Buchele, ¶11) and thus maintaining quality speech communications.

Regarding **claim 10**, Yang teaches everything claimed, as applied above (see claim 1). But Yang does not specifically teach " a residual attenuator electrically coupled to the noise detector and the noise attenuator to dampen signal power in a low frequency range when a large increase in a signal power is detected in the low frequency range." However, the examiner contends that this concept was well known in the art, as taught by Buchele.

In the same field of endeavor, Buchele discloses an adaptive speech filter to suppress ambient low frequency noise associated with wind and the use of a peak detector circuit that can respond to wind gusts (i.e., when a large increase in the signal power of the low frequency range) and effectively suppress them (¶s, 34, and 40).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Yang by specifically providing the features, as taught by Buchele, because it is well known in the art at the time of invention for the purpose of being responsive to rapidly changing circumstances (Buchele, ¶11) and thus maintaining quality speech communications.

Regarding **claim 24**, Yang discloses a noise suppression system for speech. Yang's teachings include the following:

- converting a time varying signal to a complex spectrum (Fig. 4!, FFT time domain to frequency domain);
- estimating a background noise (¶07, undesired component [including wind noise] is detected; ¶s 08-10, describe various noise analysis techniques);
- dampening the wind buffet from the input signal (¶06, "...to generate a desired output signal having predominantly speech").

But Yang does not specifically teach "detecting a wind buffet when a high correlation exists between a line and a portion of an input signal." However, the examiner contends that this concept was well known in the art, as taught by Buchele.

In the same field of endeavor, Buchele discloses an adaptive speech filter to suppress ambient low frequency noise associated with wind and the user of a peak detector circuit that can respond to wind gusts (i.e., when the input signal crosses a line it detects a wind gust) and effectively suppress them (¶s, 34, and 40).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Yang by specifically providing the features, as taught by Buchele, because it is well known in the art at the time of invention for the purpose of being responsive to rapidly changing circumstances (Buchele, ¶11) and thus maintaining quality speech communications).

Regarding **claim 26**, Yang in view of Buchele teaches everything claimed, as applied above (see claim 24). In addition, Yang teaches "the act of removing the wind buffet signal comprises substantially removing the wind buffet from the input signal. (¶29, "Noise suppression unit ...removes noise from the signal..." "can remove non-stationary noise" i.e, wind buffet).

Regarding **claim 27**, Yang discloses a noise suppression system for speech. Yang's teachings include the following:

- converting a time varying signal to a complex spectrum (Fig. 4A, FFT converts waveform to frequency domain);;
- estimating a background noise (Fig. 4A, ¶s 40-42, X is used to make estimates of the mostly noise signal);
- removing the wind buffet from the input signal (¶06, "...to generate a desired output signal having predominantly speech").

But Yang does not specifically teach "detecting a wind buffet when a high correlation exists between a line and a portion of an input signal." However, the examiner contends that this concept was well known in the art, as taught by Buchele.

In the same field of endeavor, Buchele discloses an adaptive speech filter to suppress ambient low frequency noise associated with wind and the use of a peak detector circuit that can respond to wind gusts (i.e., when the input signal crosses a line it detects a wind gust) and effectively suppress them (¶s, 34, and 40).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Yang by specifically providing the features, as taught by Buchele, because it is well known in the art at the time of invention for the purpose of being responsive to rapidly changing circumstances (Buchele, ¶11) and thus maintaining quality speech communications).

Regarding **claim 31**, Yang teaches everything claimed, as applied above (see claim 28). But Yang does not specifically teach "attenuator logic operable to limit a power in a low frequency range." However, the examiner contends that this concept was well known in the art, as taught by Buchele.

In the same field of endeavor, Buchele discloses an adaptive speech filter to suppress ambient low frequency noise associated with wind and the use of a peak detector circuit that can respond to wind gusts (i.e., when a large increase in the signal power of the low frequency range) and suppress the noise in the low frequency range (¶s, 34, and 40).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Yang by specifically providing the features, as taught by Buchele, because it is well known in the art at the time of invention for the purpose of being responsive to rapidly changing circumstances (Buchele, ¶11) and thus maintaining quality speech communications.

8. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yang in view of Walker (US Patent Application Publication 2001/0028713), hereinafter referred to as Walker.

Regarding **claim 7**, Yang teaches everything claimed, as applied above (see claim 1). But Yang does not specifically teach "the noise detector is configured to derive an average wind buffet model, and the average wind buffet model is not updated when a voiced or a mixed voice signal is detected." However, the examiner contends that this concept was well known in the art, as taught by Walker.

In the same field of endeavor, Walker discloses a technique for noise suppression. Walker's technique includes storing the last frequency spectrum recorded during a speech pause (¶s 15-17) and averaging the spectrums (¶36).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Yang by specifically providing the features, as taught by Walker, because it is well known in the art at the time of invention for the purpose of suppressing sporadic errors that might influence the model (Walker ¶36).

9. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yang in view of Coney et al. (US Patent 6,859,420) hereinafter referred to as Coney.

Regarding **claim 14,** Yang teaches everything claimed, as applied above (see claim 13). But Yang does not specifically teaches "control logic that automatically selects a microphone and a channel that senses the least amount of noise in the input signal." However, the examiner contends that this concept was well known in the art, as taught by Coney.

In the same field of endeavor, Coney discloses methods for adaptive wind noise reduction including the use of multiple sensors where sensors with high noise are given low weights and those with low noise are given high weights (i.e., selecting microphones with low noise) (col. 2, lines 3-13).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Yang by specifically providing the features, as taught by Coney, because it is well known in the art at the time of invention for the purpose of improving and rejecting wind noise and improving the detection of desired acoustic signals (Coney, col. 2, lines 15-21).

10. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yang in view of Shust and further in view of Buchele.

Regarding **claim 22**, Yang in view of Shust teaches everything claimed, as applied above (see claim 16). But Yang does not specifically teach "a residual attenuator coupled to the background noise estimator operable to dampen signal power in a low frequency range when a large increase in signal power is

detected in the low frequency range." However, the examiner contends that this concept was well known in the art, as taught by Buchele.

In the same field of endeavor, Buchele discloses an adaptive speech filter to suppress ambient low frequency noise associated with wind and the use of a peak detector circuit that can respond to wind gusts (i.e., when a large increase in the signal power of the low frequency range) and effectively suppress them (¶s, 34, and 40).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Yang by specifically providing the features, as taught by Buchele, because it is well known in the art at the time of invention for the purpose of being responsive to rapidly changing circumstances (Buchele, ¶11) and thus maintaining quality speech communications.

11. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yang in view of Shust and further in view of Vilmur et al. (US Patent 4,811,404), hereinafter referred to as Vilmur.

Regarding **claim 17**, Yang in view of Shust teaches everything claimed, as applied above (see claim 16). But Yang does not specifically teach "a transient detector configured to disable the background noise estimator when a transient signal is detected." However, the examiner contends that this concept was well known in the art, as taught by Vilmur.

In the same field of endeavor, Vilmur discloses a noise suppression system where a background update decision is prevented in transient noise is present (col. 6, lines 3-11 and lines 24-39).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Yang by specifically providing the features, as taught by Vilmur, because it is well known in the art at the time of invention for the purpose updating the background noise model when only background noise is present.

12. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yang in view of Buchele and further in view of Vilmur.

Regarding **claim 25**, Yang in view of Buchele teaches everything claimed, as applied above (see claim 24). But Yang does not specifically teach "the act of estimating the background noise comprises estimating the background noise when a transient is not detected." However, the examiner contends that this concept was well known in the art, as taught by Vilmur.

In the same field of endeavor, Vilmur discloses a noise suppression system where a background update decision is prevented if transient noise is present (col. 6, lines 3-11 and lines 24-39).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Yang by specifically providing the features, as taught by Vilmur, because it is well known in the art at the time of

invention for the purpose updating the background noise model when only background noise is present.

13. Claims 5, 6, 8 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yang in view of Vilmur.

Regarding **claim 5**, in view of the 112 2nd rejection (see above), this claim is interpreted as being similar to claim 6 (see below) and is rejected for the same reasons.

Regarding **claim 6**, Yang teaches everything claimed, as applied above (see claim 1). But Yang does not specifically teach "the noise detector is configured to limit a wind buffet correction when a vowel or a harmonic like structure is detected." However, the examiner contends that this concept was well known in the art, as taught by Vilmur.

In the same field of endeavor, Vilmur discloses a noise suppression system where a background update decision is prevented if transient noise (which could be speech data) is present (col. 6, lines 3-11 and lines 24-39).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Yang by specifically providing the features, as taught by Vilmur, because it is well known in the art at the time of invention for the purpose updating the background noise model when only background noise is present.

Regarding **claim 8**, Yang teaches everything claimed, as applied above (see claim 1). But Yang does not specifically teach "the noise detector is configured to derive an average wind buffet model that is derived by a weighted average of other modeled signals analyzed earlier in time." However, the examiner contends that this concept was well known in the art, as taught by Vilmur.

In the same field of endeavor, Vilmur discloses a noise suppression system where the current estimate of the background calculated from a weighted average of current and previous data (col. 11, lines 49-6).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Yang by specifically providing the features, as taught by Vilmur, because it is well known in the art at the time of invention for the purpose smoothing updating the background noise model (Vilmur, col. 11, lines 55-60; i.e., reducing the effects of spurious data).

Regarding **claim 33**, Yang teaches everything claimed, as applied above (see claim 32). But Yang does not specifically teach "transient logic that disables the estimation logic when an increase in power is detected." However, the examiner contends that this concept was well known in the art, as taught by Vilmur.

In the same field of endeavor, Vilmur discloses a noise suppression system where a background update decision is prevented if transient noise is present (col. 6, lines 3-11 and lines 24-39).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Yang by specifically providing the features, as taught by Vilmur, because it is well known in the art at the time of invention for the purpose updating the background noise model when only background noise is present.

14. Claim 3 rejected under 35 U.S.C. 103(a) as being unpatentable over Yang in view of Buchele well known prior art (MPEP 2144.03).

Regarding **claim 3**, Yang teaches everything claimed, as applied above (see claim 2). But Yang does not specifically teach "the noise detector is configured to fit a line to a portion of the input signal in a SNR domain." But as previously argued (see rejection of claim 24), Yang in view of Buchele teach "noise detector is configured to fit a line to a portion of the input signal" and Yang teaches the use of the frequency domain (Fig. 4A). Furthermore, the examiner takes official notice of the fact that the use of a SNR domain for the purpose of representing and calculating numbers in the frequency domain was well known in the art (i.e, dB operatons).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Yang in view of Buchele as described above, because wind noise is typically characterized as 1/f noise which when represented on a log scale (without other noise sources) plots as a

straight line which simplifies the modeling process (i.e., linear regression using a straight line).

15. Claim 34B is rejected under 35 U.S.C. 103(a) as being unpatentable over Yang in view of well known prior art (MPEP 2144.03).

Regarding **claim 34B**, Yang teaches everything claimed, as applied above (see claim 28). But Yang does not specifically teach "the signal analysis logic is coupled to an audio system." However, the examiner takes official notice of the fact that the use of noise reducing techniques in conjunction with audio systems was well known in the art.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Yang as described above, because such an approach would improve the quality of a audio system in a windy environment.

***Citation of Pertinent Art***

16. The following prior art made of record but not relied upon is considered pertinent to the applicant's disclosure:

- Gustafsson et al. (US Patent 6,175,602) disclose noise reduction by spectral subtraction.

- Berk et al. ("Data Analysis with Microsoft Excel" Duxbury Press 1998, pp. 236-239, and 256-259) teach simple linear regression and exponentially weighted moving averages (giving more weight to more recent data).
- Seely ("An Introduction to Engineering Systems" Peramon Press Inc., 1972, pp. 7-10) teach model approximations including the piecewise linear approximation.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to V. Paul Harper whose telephone number is (571) 272-7605. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached on (571) 272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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3/7/2007

VPH

V. PAUL HARPER
PRIMARY PATENT EXAMINER